SOLAR CHARGE CONTROLLER
OPERATING INSTRUCTIONS

THE TBSC SERIES SOLAR CHARGE CONTROLLER IS DESIGNED TO CHARGE WET OR SEALED LEAD ACID BATTERIES WITH 12V PHOTOVOLTAIC PANEL SYSTEMS. IT CONTROLS CHARGING CONDITION AND KEEPS THE BATTERY IN OPTIMIZED WORKING LIFE.

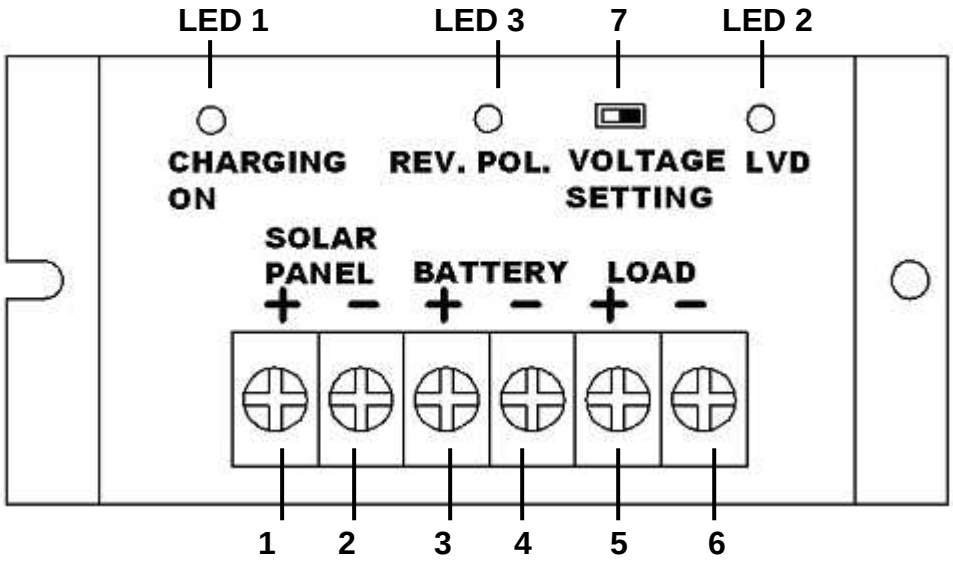

FIGURE 1

FEATURES:

- **SEALED / WET BATTERY SELECT**

  CHARGING VOLTAGE SETTING (FIGURE 1 NO. 7), 14.4V (SWITCH TO RIGHT SIDE) FOR WET LEAD ACID BATTERY, 14.1V (SWITCH TO LEFT SIDE) FOR SEALED BATTERY.

- **REVERSE CURRENT BLOCKING**

  BLOCK CURRENT FROM BATTERY TO PV ARRAY AT NIGHT.

- **LOW VOLTAGE DISCONNECT / RECONNECT**

  DISCONNECT LOAD (FIGURE 1 NO. 5 & 6) WHEN BATTERY VOLTAGE DROPS TO 11.5V TO PROTECT BATTERY FROM HARMFUL DEEP DISCHARGES. RECONNECT LOAD WHEN BATTERY VOLTAGE RECOVERS TO 12.5V.

- **TEMPERATURE COMPENSATION**

  A BUILT IN SENSOR MEASURES TEMPERATURE CONDITIONS AND ADJUSTS CHARGING VOLTAGE WITH -0.025V/˚C COMPENSATION ACCORDING TO 25˚C REFERENCE POINT.

- **POLARITY PROTECTION**

  THE UNIT IS PROTECTED FROM REVERSED CONNECTION OF BATTERY OR PANELS. HOWEVER, PV SYSTEMS OR OTHER LOAD MIGHT BE DAMAGED WHEN POLARITIES ARE REVERSED.

- **LED INDICATORS**
  - LED 1(GREEN): CHARGING CONDITION. ON WHEN SUNLIGHT IS AVAILBLE TO CHARGE, OFF WHEN SUNLIGHT IS NOT AVAILBLE OR AT NIGHT.
  - LED 3(RED): REVERSE POLARITY CONNECTION OF BATTERY OR SOLAR PANEL. (DO NOT MAKE FURTHER INSTALLATION UNTIL MISTAKE REMOVED AND LED 3 GOES OFF)
  - LED 2(RED): LVD INDICATOR. LED 2 WILL LIGHT WHEN BATTERY VOLTAGE

FALLS BELOW LVD SETPOINT AND LOAD IS DICONNECTED. THE LED WILL TURN OFF WHEN BATTERY VOLTAGE IS BACK TO RECONNECT SETPOINT.

INSTALLATION:

1. SET BATTERY CHARGE VOLTAGE BY SWITCH. (FIGURE 1 NO. 7)
2. **CABLES: <u>AWG #12 FOR 12V 13A. AWG #10 FOR 12V 25A.</u>**
3. CONNECT BATTERY TO “BATTERY +” (FIGURE 1 NO. 3), AND “BATTERY –“(FIGURE 1 NO. 4). CHECK POLARITY BEFORE MAKING CONNECTION. IF LED 3 LIGHTS ON, REMOVE CONNECTION AND MAKE POLARITY CORRECT. IF LED 2 LIGHTS ON, THE BATTERY VOLTAGE IS BELOW 12.5V, THE LIGHT WILL AUTOMATICALLY TURN OFF WHEN THE BATTERY VOLTAGE RISES ABOVE 12.5V.
4. COVER SOLAR PANEL DURING INSTALLATION AND MAKE CERTAIN THE PANEL POLARITY IS CORRECT. CONNECT PV ARRAY TO “SOLAR PANEL +” (FIGURE 1 NO. 1), AND “SOLAR PANEL –“(FIGURE 1 NO. 2). LED 1 WILL LIGHT ON WHEN SUNLIGHT IS AVAILABLE. DO NOT SHORT PV ARRAY WHEN CONNECTED TO THE CHARGER.
5. TURN OFF LOAD AND MAKE CONNECTION TO “LOAD +” (FIGURE 1 NO. 5), AND “LOAD –“(FIGURE 1 NO. 6). THEN TURN ON THE LOAD. IF LED 2 LIGHTS ON, THE BATTERY VOLTAGE IS TOO LOW, CHARGE BEFORE TURN ON THE LOAD. **NOTE**: LOADS EXCEED CHARGER’S RATED CURRENT SHOULD BE CONNECT TO BATTERY DIRECTLY INSTEAD OF “LOAD +” AND “LOAD –“TERMINALS.

INSTALLATION NOTES:

1. CONNECT TO NEGATIVE GROUNDED SYSTEMS ONLY. ALL NEGATIVE TERMINALS SHARES COMMON GROUND.
2. THE UNIT MUST BE PROTECTED FROM RAIN AND DIRECT SUNSHINE, AND MUST BE INSTALLED WITH AIR VETILATION.
3. DO NOT EXCEED CONTROLLER’S VOLTAGE AND CURRENT MAXIMUM RATING AS IN SPECIFICATION SECTION.
4. CONNECT LOADS EXCEED CHARGER’S RATING DIRECTLY TO BATTERY, NOT TO THE UNIT.
5. DO NOT SHORT PV ARRAY OR LOAD WHEN CONNECTED, THIS WILL DAMAGE THE CHARGER.
6. DO NOT REMOVE BATTERY WHEN LOAD IS ON.

SPECIFICATIONS:

Article-No.	**12V 13A**	**12V 20A**
Battery Voltage	**12V**	**12V**
Charging end voltage	**14.4V / 14.1V**	**14.4V / 14.1V**
Maximum PV panel open circuit	**25V**	**25V**
Maximum PV panel short circuit	**13A**	**25A**
Continuous load/charge current	**10A**	**20A**
No load Current(No Load and PV)	**10mA**	**10mA**
Low voltage disconnect	**11.5+/-0.1V**	**11.5+/-0.1V**
LVD reconnect	**12.5+/-0.1V**	**12.5+/-0.1V**
Temperature Compensation	**-0.025V/℃**	**-0.025V/℃**
Dimension (L x W x H)	**134.2*58.4*33 mm**	**134.2*58.4*33 mm**
Weight	**200g**	**200g**